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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,652	11/12/2003	Kang-Deog Suh	4591-344	8964
20575	7590	03/01/2006	EXAMINER	
MARGER JOHNSON & MCCOLLOM, P.C. 210 SW MORRISON STREET, SUITE 400 PORTLAND, OR 97204			NGUYEN, TAN	
			ART UNIT	PAPER NUMBER
			2827	

DATE MAILED: 03/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/712,652

Applicant(s)

SUH ET AL.

Examiner

Tan T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-11,13-17 and 19-26 is/are pending in the application.
- 4a) Of the above claim(s) 2, 12, 18 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,3,4,11,13-17 and 19-26 is/are allowed.
- 6) ☐ Claim(s) 5-7,9 and 10 is/are rejected.
- 7) ☐ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

1. The amendment submitted by Applicants on February 13, 2006 has been received.
2. Claims 1, 3-11, 13-17, 19-26 are pending.
3. The indicated allowability of claims 5-10 is withdrawn in view of the newly discovered reference(s) to Choi et al. (U.S. Patent No. 5,768,191). Rejections based on the newly cited reference(s) follow.
4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 5-7 and 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Choi et al. (U.S. Patent No. 5,768,191).

Choi et al. disclosed in Figure 3 a program and verification method for multi-state integrated circuit memory device. Choi et al. disclosed a first program voltage [Vpgm] is applied to the control gate of the memory cell to program the memory cell from a reference state ("11") towards a first program state ("10") (column 6, lines 65-67), a verification step is then performed to verify whether the cell has been programmed into the first program state by applying a first reference voltage [Vpref1] to the control gate of the memory cell (column 7, lines 7-10), if the memory cell has not been properly programmed, the first program voltage is applied to the memory again until the memory is properly programmed. Once the first program state has been verified, the memory cell is programmed into a second program state ("01") by applying a program pulse

[Vpgm] of predetermined duration (column 8, lines 34-37) to the memory cell, a verification operation is then performed by applying a second reference voltage [Vpref2] ( $V_{pref2} > V_{pref1}$ ) to the memory cell (column 7, lines 41-49, and column 8, lines 39-40). If further programming is desired to program the memory to the third program state ("00"), a program voltage pulse [Vpgm] of a predetermined duration is applied to the memory cell, a verification operation is performed by applying a third reference voltage [Vpref3] ( $V_{pref3} > V_{pref2}$ ) to the memory cell (column 7, lines 50-56, column 8, lines 49-55).

Regarding claim 6, if the second reference voltage [Vpref2] is understood as the claimed program verification voltage at nth program unit loop cycle, and the first reference voltage [Vpref1] is understood as the claimed program verification voltage at (n-1)th program unit loop cycle, then Choi et al. disclosed the second reference voltage is greater than the first reference voltage ( $V_{pref2} > V_{pref1}$ ) (column 7, line 42).

Regarding claim 7, reversely, if the second reference voltage [Vpref2] is understood as the claimed program verification voltage at nth program unit loop cycle, and the first reference voltage [Vpref1] is understood as the claimed program verification voltage at (n+1)th program unit loop cycle, then Choi et al. disclosed the second reference voltage is greater than the first reference voltage ( $V_{pref2} > V_{pref1}$ ) (column 7, line 42)

Regarding claims 9-10, Choi et al. disclosed the first reference voltage [Vpref1], the second reference voltage [Vpref2] and the third reference voltage [Vpref3] have

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different level from each other ( $V_{pref2} > V_{pref1}$ ) (column 7, line 42) and ( $V_{pref3} > V_{pref2}$ ) (column 7, line 54)

6. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

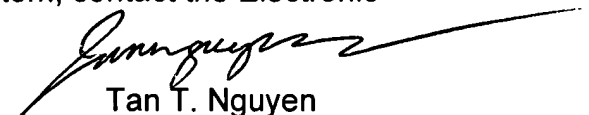
7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Koh is cited to show memory device having adjustable threshold voltage verification capability.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tan T. Nguyen whose telephone number is (571) 272-1789. The examiner can normally be reached on Monday to Friday from 07:00 AM to 03:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian, can be reached at (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tan T. Nguyen  
Primary Examiner  
Art Unit 2827  
February 22, 2006